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ABSTRACT

The effects of teaching mothers to imitate their young children during play sessions were studied with children (18 to 36 months old) who exhibited developmental delays in cognition, gross/fine motor skills, speech/language, self-help, and social skills. Mothers were taught to imitate, through providing a description of verbal and nonverbal imitation, demonstrating an imitation, providing practice in imitation, providing feedback on the amount of imitation, and graphing the number of imitations. The sessions occurred twice weekly in a center, and generalization data were collected in weekly home visits. A multiple probe design across six mother-child dyads was used to evaluate the imitation training. Results indicated that: mothers increased the frequency with which they imitated their children's behavior; they decreased the number of mands (a measure of directiveness) during intervention without specific programming regarding mands; the decrease in mands was maintained on 2-week follow-up measures; and a decrease in mands was found in the home environment for five of six mothers. The results for children indicate that during intervention they engaged in longer durations of toy play, engaged in shorter periods of watching their mothers play, and engaged in more unique play behaviors. (Contains 30 references.) (SW)

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ED 384 181

Teaching Mothers to Imitate Their Children with Disabilities: Effects on Maternal Mands and Children's Play1

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Running Head: EFFECTS OF MATERNAL IMITATION

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Abstract

This investigation assessed the effects of teaching mothers to imitate their young children with disabilities during play sessions. The strategy for teaching mothers to imitate included providing a description of verbal and nonverbal imitation, demonstrating an imitation, providing practice in imitation, providing feedback on the amount of imitation, and graphing the number of imitations. The sessions occurred twice weekly in a center, and generalization data were collected in weekly home visits. A multiple probe design across six mother-child dyads was used to evaluate the imitation training. The results for maternal interactive behavior indicate that (a) mothers increased the frequency with which they imitated their children's behavior, (b) they decreased the number of mands (directiveness) during intervention without specific programming for mands, (c) the decrease in mands maintained on two-week follow-up measures, and (d) a decrease in mands was found in the home for five of the six mothers. The results for children indicate that during intervention (a) they engaged in longer durations of toy play, (b) they engaged in shorter periods of watching their mothers play, and (c) they engaged in more unique play behaviors.

Teaching Mothers to Imitate Their Children with Disabilities: Effects on Maternal Mands and Children's Play

Parent-infant/child interactions are seen as an important focus of early intervention efforts for infants and young children with disabilities (Mahoney & Powell, 1986; McCollum & Stayton, 1985; Rosenberg & Robinson, 1988). As compared to typical infants and children, the infant/child with disabilities may display decreased vocalizations, reduced responsivity, fewer initiations, delayed or irregular smiling, and impaired communication skills during interactions (Bailey & Wolery, 1992). These behaviors may threaten the development of a positive parent-infant/child relationship. Positive parent-infant/child interactions are thought to promote child development in a number of areas (Bruner, 1982; Comfort, 1988), and are characterized by parents (a) being sensitive to the infant/child's interactive behaviors, (b) responding consistently to those behaviors, (c) responding quickly to infant/child distress, and (d) displaying positive affect during interactions (Comfort, 1988; Rosenberg & Robinson, 1988). Intervention activities that focus on parent-infant/child interactions frequently occur during caregiving routines or during play sessions.

Play between parents and children appears to be a common and natural occurrence (Odom, 1983); however, parents of infants/children with disabilities may experience difficulty in playing with their children and some parents may display almost no play

behaviors (Brooks-Gunn & Lewis, 1982; Li, 1983; Linder, 1982). When compared to mothers of typical children, play interactions of parents with disabilities children tend to be characterized by greater amounts of direction and command statements, more initiation of activities by the mother, more use of toys chosen by the mother, and less responsiveness to the efforts of the child to cooperate (Brooks-Gunn & Lewis, 1982; Cunningham, Reuler, Blackwell, & Deck, 1981; Eheart, 1982; Mahoney, Finger, & Powell, 1985). Parents of children with disabilities tend to adopt a teaching rather than interactive-partner style during interactions (Cunningham et al., 1981). The parental behaviors can influence the child's response patterns during play, the length of play, and level of play (Brooks-Gunn & Lewis, 1982; Li, 1983). Children with disabilities may be less interactive and responsive during play (Eheart, 1982) and use less expressive language (Cunningham et al., 1981). Further, the highly directive interaction style may inhibit the child's acquisition of necessary skills or abilities to initiate play activities at the rate at which typical children develop those skills (Mahoney et al., 1985).

Mahoney et al. (1985) found that the more controlling and directive the parent, the lower the scores of the child with disabilities on a cognitive development scale. In contrast, children with disabilities scored higher when their parents were more responsive to the child's interests and showed greater encouragement for the child to initiate play activities. Parents have been taught to use a number of strategies to

encourage children to be more actively involved during play episodes. These include following the child's lead, structuring for give-and-take by waiting for the child to respond, being animated while playing with the child, imitating the child, choosing appropriate and durable toys, and taking time to enjoy the activity (Linder, 1982; Musselwhite, 1986).

Parental imitation of the child's behavior has been recommended as a strategy for increasing parental responsiveness. When parents imitate their children, the children become aware of their influence and role in the interaction (MacDonald & Gillette, 1985). Brown-Gorton and Wolery (1988) reported a decrease in directiveness as measured by the number of maternal mands when mothers were taught to imitate their children with disabilities during play sessions. Mands were defined as verbal commands, requests, or questions that directed a change in the child's behavior. Despite the decrease in maternal mands, Brown-Gorton and Wolery (1988) did not measure children's play behaviors.

The present study sought to expand upon the results of Brown-Gorton and Wolery (1988) by addressing four questions: (a) Will instruction on imitation increase the number of imitations (a measure of responsiveness) exhibited by the mother during play sessions, (b) will instruction on imitation decrease the number of mands (a measure of directiveness) exhibited by the mother during play sessions, (c) will the effects of instruction on imitation in play sessions at a center generalize to play sessions at home, and (d) will changes in maternal behavior during play sessions increase the child's exploration and manipulation of toys

(i.e., duration of time spent with toys, duration of time spent watching the mother direct play, the number of different unique actions on toys, and the number of higher level object-interaction skills) during play sessions?

Methods

Participants

Six mother-child dyads who were receiving services from a local preschool program participated in the project. Dyads were selected based on the type of parental interaction during a play situation and the functional level of the child. Parents were selected who had an initial number of mands (directiveness) at least three times the number of imitations (responsiveness). The children selected to participate received services at the center, ranged in age from 18 to 36 months, and exhibited developmental delays in one or more of the following areas of development: cognition, gross/fine motor, speech/language, self-help/social skills. Developmental levels were determined on the basis of the Early Learning Accomplishment Profile (Early LAP) (Glover, Preminger, & Sanford, 1978). Each of the children had voluntary movement of the upper body, intact auditory and visual systems, and the ability to sit and interact with their parents for ten minutes as determined during an initial home screening visit. Developmental levels and chronological ages of children are shown in Table 1.

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Insert Table 1 about here

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Setting and Materials

The study was conducted in two settings: The center and home. Twice weekly center visits were conducted in a small area (5 x 3 feet) of a room (8 x 10 feet) at the preschool center. The parent and child were seated on the floor in the center of the area with the observer sitting on a chair approximately 3 feet from the dyad. Weekly home visits were conducted to assess the generalization of the intervention on the number of maternal mands and imitations. The home visits were conducted in the family room of each dyad's home in a play area free of distracting objects. The telephone was taken off the hook to prevent calls during the data collection period. The parent and child were seated on the floor with the observer approximately 3 feet from the dyad. Toys used during the sessions were selected on the basis of the children's developmental levels and interests and were varied randomly each session. Duplicates of each toy were available during all sessions to encourage actual imitation with identical toys.

Response Definitions and Data Collection Procedures

Data were collected on three dependent measures: (a) maternal imitation, (b) maternal mands, and (c) child exploration of toys as indicated by the number of unique behaviors with toys, the duration of

time spent interacting with toys, the duration of time spent watching while the mother directed the toy activity, and the number of behaviors indicating a type of object-interaction skill.

Maternal behaviors. Maternal imitation was defined as copying or reproducing the child's vocalizations, gestures, body movements, or facial expressions within 3 seconds after the child produced the behavior. Nonverbal imitations (gestures, body movements, and facial expressions) and verbal imitations were recorded separately. Maternal mands were defined as verbal or nonverbal requests or commands requiring a response on the part of the child. Kaye and Charney (1980) describe mands as characterized by (a) a question format or syntax; (b) a command, direction or request that is verbal or by manipulation; (c) a point or gesture calling attention to a toy or object that is not currently the topic of interest; and (d) an expectant look indicating the need for a response.

A Radio Shack, Model 100 lap-top computer and printer with The Behavior Observation System (Denny, 1987), a continuous measurement, event-recording system, was used to collect the data on the number of maternal imitations and mands. This system facilitated the reliable collection of data on parent behavior and provided an exact record of each behavior. Observation was conducted for all sessions during a 10-minute period. The investigator observed and recorded maternal imitations and mands during the center and home sessions.

Child behaviors. Three different child behaviors were

measured: (a) the number of unique behaviors with toys, (b) the duration of time spent interacting with the toys, and (c) the duration of time spent watching while the mother directed the toy activity. Unique behaviors with toys were defined as any deliberate motor or physical interaction with the toy not previously observed. Total duration of time spent with the toy was defined as the total amount of time the child was engaged in any deliberate interaction, physical or verbal, with the toy. Total duration of time spent watching the mother was defined as the total amount of time the child watched the mother while she was deliberately interacting with the toy, directing the activity such as showing the child how to operate the toy, or showing the child a new activity with the toy.

The unique behaviors with a toy were subsequently categorized according to type of object-interaction skill: sensorimotor, conventional, or symbolic (Musselwhite, 1986). Sensorimotor behaviors were defined as orientational responses to the toy, locomotor exploration of the toy, and investigatory exploration of the toy (Wehman, 1977). Conventional object interactions were defined as interacting with the toy in a functional manner, or in a way in which the toy was meant to be used (Musselwhite, 1986). Symbolic object interaction behaviors were defined as using the toy in a representational or pretend manner.

Child behaviors were recorded via video camera. Measurement of child behavior took place only during center sessions. Assessment of the recorded child behavior was completed after each center session using event and total duration recording. Each movement with the

toy was listed for each session, and the lists were compared to identify unique behavior. Durations were recorded with a stop watch.

Reliability. Two observers recorded behaviors during sessions in each experimental condition for each dyad. Interobserver agreement for maternal imitations and mands was derived using a reliability component of the computerized data collection program. The formula of number of agreements divided by agreements plus disagreements multiplied by 100 was used. Agreement was reached only when both observers recorded the same behavior within the same 5-second time period. Percentage of agreement was calculated for each child behavior using the gross method (dividing the smaller number by the larger number and multiplying by 100) (Tawney & Gast, 1984).

Procedures

General procedures. Two center sessions and one home session were conducted each week for each mother-child dyad. The time of day for the sessions was the same each week as arranged with the parents and lasted about 30 minutes. Three toys and their duplicates were selected for each child and placed in the play area before the session. Each session began with a get-acquainted discussion and preparation for the observation period. This was followed by a 10-minute play period for observation. Sessions closed with a discussion about the play period and toy selection and purchasing suggestions for parents.

Experimental design. A multiple probe design across subjects (mother-child dyads) (Tawney & Gast, 1984) was used to

evaluate the effectiveness of the intervention.

Probe condition sessions. The probe procedure for center sessions included three segments: (a) introduction (get-acquainted) and preparation for observation, (b) play session for data collection, and (c) toy selection and purchasing suggestions along with a closing discussion. Preparation for observation included a check of the video and computer equipment and attendance to any of the child's physical needs. The parent, child, and investigator took their positions. Data collection commenced when the investigator said, "Are you ready? Using the toys provided, please begin playing with your child as if I were not here." During the closing discussion, parents were asked about their satisfaction with the selected toys and were given toy selection materials. The schedule for the next center and home visit were also confirmed. During the first session, parents were told that the purpose of the study was to observe parent-child interaction during play and provide suggestions for helpful ways to interact with their children during play sessions.

Intervention condition sessions. After stable probe performance was established, intervention during center sessions began and data collection continued. Each session consisted of four segments: (a) general introductory comments and preparation for observation, (b) imitation instruction and a 10-minute play session for data collection, (c) review of the data with the mother, and (d) toy selection discussion and closing comments. Introduction and preparation for observation were conducted in the same manner as probes.

Imitation instruction included a description and demonstration of imitation, a discussion of imitation, and time to practice. Parents were not told that mands were being measured. Imitation was defined verbally to parents as an immediate copying or reproducing of gestures, vocalizations, body movements, or facial expressions made by the child. Parents were instructed not to imitate inappropriate behaviors. These behaviors were defined as those harmful to the parent or child, destructive to the toy or the surrounding environment, or escapes from the observational area. After fielding any questions from the mother, the investigator demonstrated a verbal and gestural imitation using a behavior of the child at the time. The parents then had an opportunity to practice a verbal imitation and a gestural imitation. Feedback was provided to parents regarding the practice episode. Data collection immediately followed with parents instructed to imitate their child three or four times per minutes.

After data collection, the investigator summed the number of imitations and provided verbal praise to the mother regarding any increase in the number of imitations or attainment of the criterion set at the beginning of the session. Parents completed a graph illustrating the number of imitations observed during the session and any previous intervention sessions. The closing segment of the session was identical to that used in the probe sessions.

Criteria for terminating the intervention procedure was established prior to the intervention conditions and was the occurrence of

three plus imitations per minute and a concurrent decrease in mands to less than three per minute. Two center sessions were scheduled two weeks after the final intervention center session for each dyad to assess maintenance of the intervention.

Procedural reliability data were collected to assess the accuracy with which the investigator implemented the experimental procedures (Billingsley, White, & Munson, 1980). During intervention, the following variables were measured: (a) arrangement of room, (b) instruction to imitate 3 to 4 times per minute, (c) definition and description of imitation, (d) demonstration of imitation, (e) description of inappropriate behaviors, (f) instruction to begin play, (g) instruction to end session, (h) verbal feedback, and (i) assistance with graphing.

Generalization sessions. Data on maternal imitations and mands were also collected during weekly home visits throughout the investigation to allow for an assessment of generalization. Each visit included three segments similar to the center probe sessions: (a) introduction and preparation for observation, (b) play session data collection, and (c) closing discussion. The computer equipment was checked immediately prior to the home visit. Home visits began with rapport-building discussion and attendance to any physical needs of the child. The parent, child, and investigator took their positions, seated on the floor. Data collection commenced when the investigator said, "Are you ready? Using the toys provided, please begin playing with your child as if I were not here." This segment lasted for 10-minutes. The closing discussion

included any comments on parental satisfaction with the selected toys and the schedule for the next center and home visit.

Results

Interobserver Agreement for Mother and Child Behavior.

Reliability data were collected on (a) 44% of the probe and intervention sessions, and (b) 20% of the probe and intervention video tapes of child behaviors. Interobserver agreement data for maternal behaviors was 94% with a range of 75-100% per session. Observed child behaviors were recorded consistently with a mean of 95% and a range of 67-100%. Interobserver agreement percentages for maternal and child behaviors are shown in Tables 2 and 3, respectively.

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Insert Tables 2 and 3 about here

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Procedural Reliability Data

The investigator's compliance in implementing the procedures of the study was assessed in 31% of the sessions. During probe conditions, the variables of room arrangement, instructions to begin play, and instructions to end the session were measured and were implemented with 100% accuracy. During intervention all behaviors were implemented with 100% accuracy, except instructions to imitate 3 to 4 times per minute, description of inappropriate behaviors, and assistance with graphing, which each were implemented with 86% accuracy.

Effects of the Imitation Instruction

Maternal behaviors. The number of imitations and mands for each center session for all parents during probes, imitation instruction, and follow-up conditions is shown in Figure 1. With the onset of the intervention condition, all six mothers showed immediate increases in the number of imitations and immediate reductions in the number of mands. During the probe condition, the number of mands ranged from 65 to 147 per session, while the number of imitations was less that 15 per session for each parent. The number of imitations increased markedly during intervention with a range of 35 to 120.

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Insert Figure 1 about here

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The Revusky Rn test of ranks was used to evaluate the data statistically (Revusky, 1967). This test is designed for multiple baseline data where the order of treatment is randomly assigned. The adaptation of the Rn test for level changes (Wolery & Billingsley, 1982) was conducted for the maternal imitation data (verbal and nonverbal data combined) and the maternal mand data. The level changes at the point of intervention for both imitations and mands were statistically significant ($p. < .005$).

During the first follow-up session, as illustrated in Figure 1, Mothers 1, 3, 4, and 5 used a lower number of mands and a higher number of imitations. Although Mothers 2 and 6 displayed fewer mands consistent with the number reached during intervention, the number of

imitations did drop.

Generalization sessions were conducted during probe and intervention conditions in the home setting for all dyads. Both imitations and mands were measured during these sessions and the results are displayed in Table 4. Upon the onset of the intervention condition, a decrease in mands and an increase in imitations occurred in the home setting for Mothers 1, 3, and 5. A decrease in mands occurred for both Mothers 2 and 4, but no increase in imitations for Mother 2 and a slight increase for Mother 4 occurred. Mother 6 showed little change in mands or imitations in the home setting; however, during a home session that occurred after the purpose of the investigation was explained, Mother 6 decreased mands and increased imitations.

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Insert Table 4 about here

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Child behaviors. Child behaviors indicating exploration of an interaction with toys were measured and are shown in Table 5. Following imitation instruction, the average number of unique behaviors with a toy increased for all children with the exception of Child 6. The number of behaviors for Child 6 remained about the same during probe and intervention sessions. During follow-up sessions, the number of unique behaviors also increased for Child 1 and 6, while decreasing to a number similar to probe performance for Children 2, 3, 4, and 5.

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Insert Table 5 about here

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After imitation instruction was initiated, the average duration of time spent with a toy increased for all children except for Child 2, who spent less time interacting with toys. During follow-up, minutes spent interacting with toys increased for all children except Children 3 and 4. Time spent watching the mother direct the toy play decreased for all children with the introduction of intervention, and remained lower during follow-up.

The last measure used to determine the extent and type of child exploration of the toys was the classification of the identified unique behaviors into three types of object-interaction skills: sensorimotor, conventional, and symbolic. Children 1, 2, and 3 exhibited behaviors primarily in the conventional object-interaction category and increased the numbers of these behaviors with the introduction of imitation instruction. Child 4 reduced the number of exploratory behaviors and increased behaviors in the conventional and symbolic categories. Child 5 increased the number of exploratory and symbolic behaviors, and decreased the number of conventional behaviors. Behaviors primarily in the exploratory category were observed for Child 6 during probes and intervention. Numbers of behaviors within specific categories were inconsistently maintained by five of the children.

Discussion

This study documented the effectiveness of teaching mothers to imitate their children (a measure of maternal responsiveness) to modify the amount of maternal directiveness (as measured by the number of maternal mands) during play interactions. The study also examined the effect of changes in maternal directiveness and responsiveness on children's interactions with toys. In general, maternal behaviors during the probe condition consisted of a high number of mands and a low number of imitations. Imitation training resulted in an increase in the number of maternal imitations and a concurrent decrease in the number of maternal mands for all six mothers. This effect occurred despite the fact that mothers were not told to decrease maternal mands and were not told that maternal mands were being measured. This finding replicates the findings reported by Brown-Gorton and Wolery (1988).

Unlike Brown-Gorton and Wolery (1988), the current study investigated the maintenance of effects from the imitation instruction. In the current study, the decrease in mands and the increase in imitations were maintained in a 2-week follow-up session for four of the six mothers. The remaining two mothers, 2 and 6, maintained a lower number of mands, but displayed imitations similar to probe levels. Thus, for all mothers, the follow-up sessions were characterized by less directive behaviors than the initial probes sessions.

Similarly, the effects of the intervention generalized to the home setting with decreases in mands and increases in imitations for four

mothers. The remaining two mothers used a lower number of mands, but their use of imitations were not as high as in the center-based sessions. Although they used imitations when instructed to do so during center sessions, these two parents did not imitate frequently during follow-up or home generalization sessions. Possible explanations for the decrease in imitations for both parents include their perception of the instruction such as imitating all behaviors including inappropriate ones, their level of comfort with imitations, and learning other responsive behaviors to replace imitations. However, it is clear that the imitation instruction appears to produce reliable, somewhat durable, and generalized effects on the number of maternal mands. Thus, it is seen as a viable intervention for reducing the directiveness of mother-child interactions.

Mothers who were successful in imitating at a rate that effectively reduced their directiveness appeared to show a definite change in the style of interaction after intervention. Similar results were noted by Mahoney (1988) that parents who were 'ess directive were more sensitive to, more responsive to, and enjoyed being with their child more. The parents who were most successful with the imitation instruction and concurrent reduction of mands noticed a difference in their interactions with the child and commented that they liked using imitations and would continue to do so.

Changes in maternal behavior appeared to have a greater effect on the length of time children interacted with toys rather than on the type or level of toy interaction. Changes in the type and level may

come only after sustained interactions with toys over time. Maintenance of the number of unique behaviors with toys occurred for only two of the six children. Five children maintained an increase in the amount of time spent with toys, and all children maintained a decrease in the amount of time spent watching the mother direct the activity. Four of the children maintained their performance changes in terms of the number of behaviors which indicated object-interaction skills.

The results of this study have several implications for work with parents and their young children with disabilities. First, the findings from the probe sessions are consistent with previous research indicating that some mothers of children with disabilities display a high frequency of mands during interactions with their children. Thus, professionals should expect that some of the parents in their case loads are likely to interact in directive ways with their children who have disabilities. Second, use of the imitation instruction increased the frequency of imitations, but more importantly produced decreases in the number of mands.

Interestingly, the decrease in the number of mands maintained in the 2-week follow-up and generalized to home play sessions for all parents, although this was not true for the increases in imitations. Thus, imitation instruction may be a viable intervention for reducing maternal directiveness without telling mothers to be less directive. This makes it a proactive intervention of instructing parents to engage in new behavior (i.e., imitating) rather than a reactive intervention of

instructing them to stop being directive. Third, the imitation instruction appeared to be related to some reliable change in children's play behavior, such as increases in unique behaviors with toys, decreases in watching the mother play, and increases in the duration of toy contacts. However, these changes were slight and may require further intervention before meaningful changes in children's play occur. Fourth, the imitation instruction was implemented reliably and easily. It did not require extensive material preparation, interventionist effort, or modifications to maternal schedules. Thus, the intervention is parsimonious and not intrusive.

Future research should examine the use of imitation instruction in combination with other strategies for reducing maternal directiveness and increasing responsiveness (Mahoney & Robenalt, 1986). Imitation instruction can reduce the frequency of maternal mands, but by itself may be a limited measure of maternal responsiveness. Thus, future research should measure multiple dimensions of responsiveness such as imitation instruction paired with following and building upon the child's lead. Collecting multiple measures of responsiveness and implementing interventions that include multiple strategies for ensuring maternal responsiveness would give mothers more options for providing growth promoting experiences for their children (Moran & Whitman, 1985; Mahoney, 1988; Mahoney & Powell, 1988). The use of imitation instruction in situations other than play sessions also should be assessed. Likewise, covert measurement of generalization

effects are needed. In the current study, the presence of the observer could have cued parents to perform in patterns different from their day-to-day interactions with their children.

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Table 1
Children's Developmental Levels

Subject	Chronological Age[b]	Developmental Age on Subtests[a]					
		Gross Motor	Fine Motor	Social	Self-Help	Cognitive	Language
Child 1	27	21	21	18	16	18	20
Child 2	23	11	24	25	15	22	20
Child 3	22	20	16	21	17	17	8
Child 4	31	10	13	15	10	13	13
Child 5	22	13	13	20	15	13	13
Child 6	15	5	10	12	9	10	10

[a] The values represent age in months.

[b] The chronological age of the child was noted when the test was administered; the test was given 3 months prior to the initiation of the research.

Table 2

Mean Percent of Interobserver Agreement on Maternal Dependent Measures

Behavior / Subject	Condition: Probe Mean	Probe Range	Intervention Mean	Intervention Range
MANDS				
Mother 1	93	89- 97	95	93- 97
Mother 2	95	94- 96	88.7	80- 96
Mother 3	93.5	99- 99	94	93- 95
Mother 4	94	93- 95	91	88- 94
Mother 5	93	91- 95	78.5	75- 82
Mother 6	81	71- 91	91.5	90- 93
VERBAL IMITATIONS				
Mother 1	100	--	96.3	89-100
Mother 2	100	--	100	--
Mother 3	100	--	100	--
Mother 4	93.5	87-100	87.5	75-100
Mother 5	100	--	86	80- 92
Mother 6	100	--	96.5	93-100
NONVERBAL IMITATIONS				
Mother 1	100	--	93.3	90- 97
Mother 2	100	--	100	--
Mother 3	100	--	87.3	83- 92
Mother 4	92.5	85-100	87.5	86- 89
Mother 5	100	--	91.5	87- 96
Mother 6	100	--	87.5	83- 92

Table 3

Mean Percent of Interobserver Agreement on Child Dependent Measures

Subject	Measure					
	Duration W/Toys	Duration Watching Mother	Number of Unique Behaviors	Sensori-Motor Play	Conven-tional Play	Symbolic Play
Child 1	98.5 (98-99)	94 (93-95)	92.5 (91-94)	75 (75-75)	92.5 (92-93)	100 (100-100)
Child 2	92 (90-94)	98 (96-100)	97.5 (97-98)	88 (86-90)	96 (92-100)	91.5 (83-100)
Child 3	98.5 (97-100)	98 (97-99)	90.5 (88-93)	100 (100-100)	98 (96-100)	90 (80-100)
Child 4	95.5 (92-99)	96 (94-98)	94.5 (89-100)	100 (100-100)	91.5 (83-100)	83.4 (67-100)
Child 5	94 (90-98)	86.5 (75-98)	94.5 (89-100)	91.5 (83-100)	96 (92-100)	100 (100-100)
Child 6	98 (97-99)	96 (94-98)	92 (89-95)	86 (82-90)	91.5 (83-100)	100 (100-100)

Table 4

Number of Maternal Mands and Imitations inthe Home Sessions for Probe, Intervention, and Follow-up Conditions

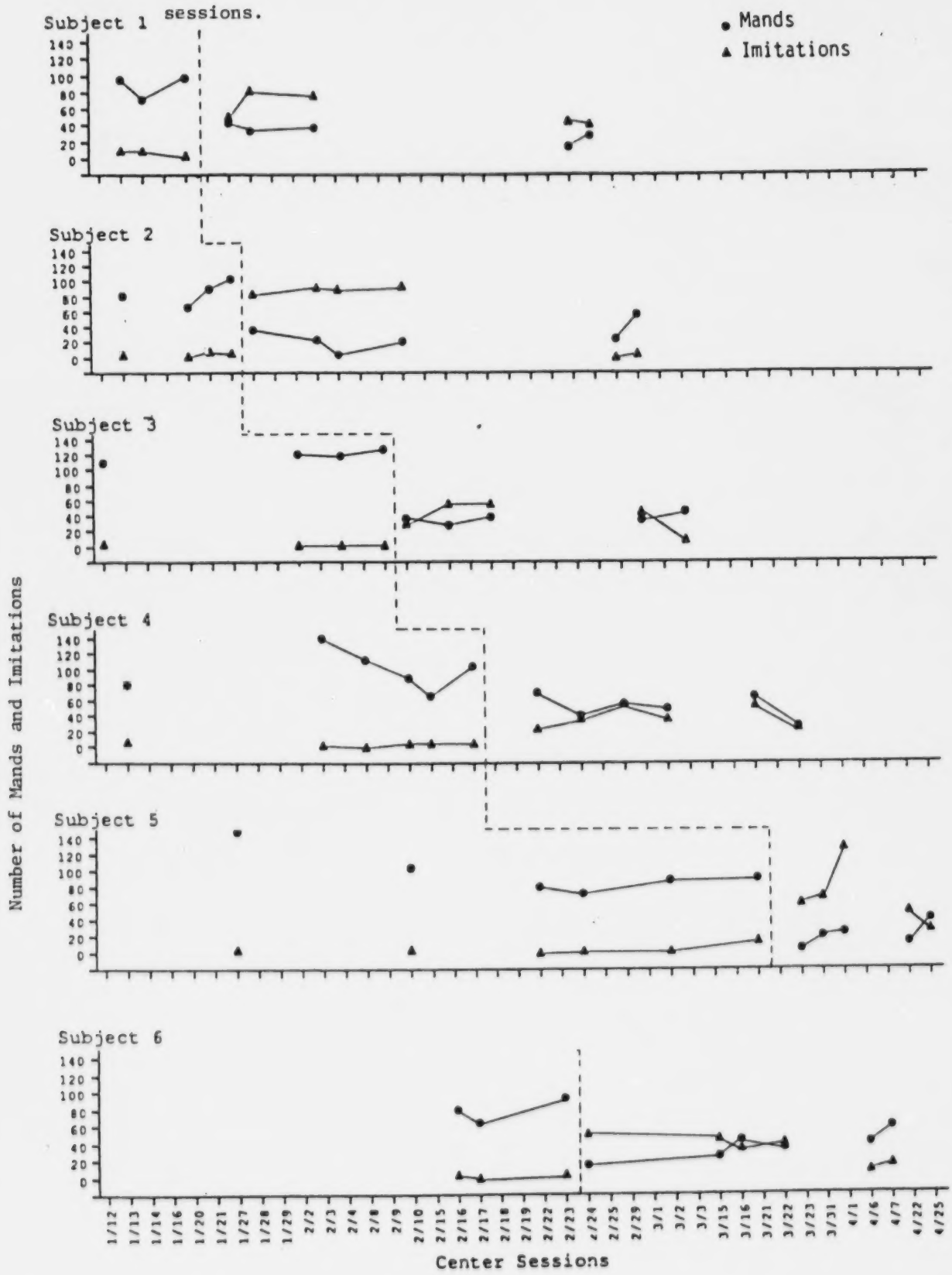
Subject / Behavior	Conditions				
	Probe		Intervention		Follow-up
	Mean	(Range)	Mean	(Range)	Mean
Mother 1					
Mands	90	(83-97)	35		43
Imitations	7.5	(5-10)	36		40
Mother 2					
Mands	74.5	(71-78)	61.3	(33-87)	37
Imitations	3	(0-6)	3.5	(1-4)	18
Mother 3					
Mands	117.3	(90-40)	44		44
Imitations	.7	(0-1)	51		54
Mother 4					
Mands	80.3	(60-92)	46		41
Imitations	3.6	(1- 6)	14		19
Mother 5					
Mands	95.5	(89-102)	34	(29-39)	8
Imitations	0		40.5	(9-72)	89
Mother 6					
Mands	56		69	(62-76)	37
Imitations	2		5.5	(1-10)	22

Table 5

Child Exploration and Interaction with Toys During Experimental Conditions

Subject Condition	Measure					
	Unique Behaviors With Toys	Duration of Interactions With Toys	Duration of Watching The Mother	Explor-atory Skills	Conven-tional Skills	Sym-bolic Skills
Child 1						
Probe	13.0	6.9	1.5	1.3	12.3	1.0
Intervention	22.0	7.2	0.9	4.0	16.3	2.3
Follow-up	24.0	9.0	0.2	6.0	16.0	2.0
Child 2						
Probe	19.0	8.3	1.3	7.0	11.5	3.3
Intervention	25.0	7.1	0.5	9.5	12.8	2.3
Follow-up	18.0	8.6	0.5	4.0	13.0	0.0
Child 3						
Probe	22.0	6.0	3.9	5.0	13.5	2.0
Intervention	29.0	7.1	0.5	7.0	18.3	4.0
Follow-up	15.0	3.8	1.0	3.0	12.0	0.0
Child 4						
Probe	12.0	2.4	5.3	6.8	3.0	1.7
Intervention	13.0	3.8	3.3	5.3	4.5	3.0
Follow-up	12.0	3.5	3.3	5.0	4.0	3.0
Child 5						
Probe	19.0	7.1	3.8	6.3	10.2	2.5
Intervention	21.0	8.3	0.1	7.3	7.6	5.6
Follow-up	15.0	9.2	0.3	5.0	5.0	5.0
Child 6						
Probe	21.0	6.1	2.6	13.0	8.0	0.7
Intervention	21.0	6.4	0.7	11.8	8.8	0.7
Follow-up	29.0	7.4	1.3	10.0	20.0	0.0

Figure 1 The number of imitations and mands during 10-minute observation sessions in the center for the six mothers.


sessions.
Mands
Imitations
Subject 1
Subject 2
Subject 3
Subject 4
Subject 5
Subject 6
Number of Mands and Imitations
Center Sessions